

II. Remarks

Claims 1 through 14 stand rejected. Claims 1, 4, 5, and 12 are being amended.

As amended, claim 1 requires detecting the torsional vibrations of one or more wheels of a vehicle to produce an angular frequency spectrum in an angular frequency domain to determine if there is pressure loss in tires associated with the wheels. After pole pitch errors are eliminated from the spectrum, a peak frequency in the spectrum is mapped from the angular frequency domain to a time frequency domain. Changes in the peak frequency are related to pressure loss in one or more tires associated with the wheels.

Accordingly, claims 1 through 14 remain pending. Reconsideration and re-examination of this application in view of the above amendments and the following remarks is herein respectfully requested.

Claim Rejections - 35 U.S.C. §103(a)

Claims 1-2 and 12-13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,725,136 to Lutz, et al. (Lutz) in view of U.S. Patent No. 6,550,320 to Giustino (Giustino). Claim 3 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Lutz and Giustino and further in view of U.S. Patent No. 5,588,721 to Asano, et al. (Asano). Claims 4-11 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lutz and Giustino and further in view of U.S. Patent No. 4,574,267 to Jones (Jones

'267). Claim 14 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Lutz and Giustino and further in view of U.S. Patent No. 5,541,573 to Jones (Jones '573).

Lutz discusses a method of determining tire condition of a vehicle from the wheel rotation speed and from longitudinal, lateral, and/or vertical acceleration detected by an accelerometer mounted to the vehicle. Two methods of data analysis are provided, which may be utilized alone or in combination. As stated at column 2, lines 60-64, one method compares the waveform of the acceleration to a mathematical *model* of the suspension system and/or vehicle dynamics to identify an error. The other method, as stated at column 2, line 65 to column 3, line 6, provides direct measurement of the resonant frequencies using an accelerometer on the suspension. Power spectral methods may be used in this direct measurement method to detect changes in characteristic frequencies.

As the Examiner states in the Office Action, Lutz's *model* used in the modeled approach may be in the time domain (see, e.g., column 9, lines 54-56). In the direct measurement approach, however, Lutz does not describe mapping a peak frequency of the torsional vibrations of one or more wheels from an angular frequency domain to a time frequency domain. Applicants' invention on the other hand, as recited in amended claim 1, requires detecting torsional vibrations of one or more wheels to produce an angular frequency spectrum in an angular frequency domain and mapping a peak frequency from the angular frequency domain to a time frequency domain.

The Examiner states that Guistino discusses eliminating pole pitch errors in an angular spectrum. Guistino, however, individually or when combined with Lutz, fails to disclose or suggest the features lacking in Lutz, namely detecting torsional vibrations of one or more wheels to produce an angular frequency spectrum in an angular frequency domain and mapping a peak frequency from spectrum in the angular frequency domain to a time frequency domain. In that Guistino fails to disclose or suggest these features which were previously noted as being absent in Lutz, it must be concluded that the combination of Lutz with Giustino cannot render claim 1 as obvious. The rejection of claim 1, and hence dependent claims 12 and 13, under 35 U.S.C. §103(a) is therefore improper and should be withdrawn.


As for the other references cited by the Examiner, Asano discusses detecting vibrations with an ABS encoder, Jones '267 discusses modifying and characterizing frequency spectra, and Jones '573 discusses detecting tire deflation above 40 kph. Therefore, none of these three references cures the deficiencies of Lutz or Guistino. Accordingly, since claims 3-11 and 14 depend from claim 1 directly or indirectly, the reasons for allowance of claim 1 apply as well to dependent claims 3-11 and 14.

Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present form of the claims (claims 1 through 14) are patentably distinguishable over the art of record and that this application is now in condition for allowance. Such action is respectfully requested.

Respectfully submitted by,

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